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SYSTEMS AND PROCEDURES QUARTERLY

IN THIS ISSUE

The Systems Department—Its Design and Construction —*John M. Haslett*

Methods Work in MATS—*Lem F. Thom*

Systems and Procedures—from the Ground Up —*Vincent P. Connolly*

Why Procedure Manuals Differ —*Robert C. Weisselberg and Harold M. Bailer*

Organization Planning—What It Will Do for You —*R. C. Campbell*

The Office Manager's Challenge—*Charles B. Shafer*

Forms Control—*John L. Primm*

Also, Worth Reading, Book Review, Bibliography

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"... to provide a means for the study and dissemination of knowledge relative to systems and procedures through research, discussion and publications"

— from the Association's By-Laws

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The Systems Department —

Its Design and Construction

by John W. Haslett

Some of the major considerations that can't be slighted in building a systems unit

EVOLUTIONARY influences have been at work for many years and are still at work upon the systems function in industry. In fact the evolutionary cycle may be observed in the development of the systems function in a typical enterprise which has grown from a small company to one of medium size or large proportions. The cycle may be considered in terms of a number of phases.

The first phase occurs when the growth of an enterprise brings about the need for administrative planning and control which for present purposes, may be considered to involve non-routine problems of creative thinking as opposed to the routine and recurring judgments regularly exercised by all levels of management. These may be, but are not necessarily, limited to organization and procedures planning and control.

Phase two occurs when recognition is given to the need for administrative planning after conditions of growth have brought it about. At this point, usually starting with top management, each managerial level assumes the planning and control function as part of its normal administrative duties. Procedures planning and forward thinking on organizational problems form a basis on which future problems may be anticipated before they occur and solutions to these problems devised to be ready for use at the appropriate moment.

As the enterprise continues to grow, organizational and procedural problems become more numerous and complex, with a consequent increase in their demands on the time of the operating levels of management. As is so often the case, the results which have been obtained from work in this field, combined with the diminishing availability of time on the part of operating supervisors and managers, indicate the desirability of full-time specialists being designated to assist all levels of management in the field of administrative planning and control. The need to abandon part-time planning in favor of full-time planning is phase three of the cycle.

Phase four comes into being with the establishment of a special staff within the organization to carry out these

functions on a formally organized and systematic basis.

Before putting thought into action, it is usually wise to have a clear concept of the principles behind what is to be done. It is therefore appropriate that we now get down to the principles which underlie the formal methods function and review the elusive manner in which these principles apply in the designing and building of a systems department.

Although there may be others, three fundamental principles are of significant consideration. First, the pattern of a systems organization as well as the approach to building such an organization should be tailor-made to the situation existing in the specific company. Otherwise, there will be a dangerous lack of realism from the start. Individual company situations may be sized up in terms of numerous factors, such as the number and type of employees, management attitudes, the structure of the company organization, the type of products it makes, its methods of distribution and many other factors. In the interplay among these factors, each one influences others and is itself influenced. In fact, it takes more than a dash of intuition to discern from this complex pattern the best course of approach.

Should Anticipate Revisions

The second fundamental is that the design of the systems department should anticipate revisions in the future as objectives are accomplished and as conditions change. This insures an essential flexibility without which the department might well find itself lagging behind the progress of the company as a whole. The third fundamental is that building the department should be a continuing process of staff, program and project planning. Here again is where flexibility is of paramount importance because the analysts, the objectives and the work assignments must at all times be balanced in terms of the changing needs of the company as a whole. If proper attention is paid to these three principles, the plan for a concrete design for the department will be greatly facilitated.

The considerations which affect the concrete design are six in number: (1) reasons for establishing the department, (2) its placement within the company organization, (3) staffing policies, (4) program planning, (5) project planning, and (6) reporting progress. Let's review these considerations one by one.

A methods group is needed to remedy existing deficiencies in organization, systems and standards. By standards, of course, are meant those applicable to space, equipment, forms, procedures and clerical work measurement. Without continuing attention being directed toward these areas of a company, its affairs may go awry without the true reasons ever being identified and the situation corrected. Another reason for having a methods group is to provide an instrument to assist in forward planning for changes in organization and systems as the need arises. Growth brings change and even as long-range operational and financial forecasts are universally accepted tools of management there is every reason for comparable long-range organization and systems planning.

Staffing patterns and the adequacy of various procedures as work loads increase are items which readily lend themselves to long-range anticipation. A third justification for establishing the department is the need for internal and external research in the field of management improvement. Administrative techniques are constantly changing for the better and an awareness of what is happening along these lines in industry generally is a must for an enlightened company.

The placement of the department within the company is the second consideration, a consideration where there is a general conflict of opinion among systems people. This difference of thought stems from our own desires for job satisfaction, remuneration and prestige. To accomplish these ends we may choose different courses. There is one school of thought which advocates the office of the president as the best shelter for the systems department. Another argues in favor of a location in the financial organization, a location which has met with more general acceptance than the other alternatives. An objective selection of the placement of the department should however be based upon the logic of situating it as high in the organization as it can be, yet gain prompt and universal acceptance. Another factor to be taken into account is that often problems may best be solved in that part of the organization where they are most acute. Here the operational know-how is immediately available to those who have the time and the systems training to take advantage of it.

Centralized or Dispersed?

Then there is the question of the centralized department versus the decentralized. Should the job be done by a headquarters staff circulating in the field? Or should it be done by divisional systems staffs whose programs and techniques would be coordinated from a small systems advisory group in the home office? Here we can revert to the first fundamental principle—the department should be tailor-made to fit the particular company. Size of the company, diversification of its products, dispersal of its offices should point the way for or against systems staff centralization. Management policies might even suggest that the operating divisions themselves *without* their own special staff be responsible for management improvement programs and projects coordinated by a small advisory group in head office.

Wherever the systems responsibility is placed, the scope of activities should be clearly defined by top management

and clearly understood by all segments of the entire organization. There should be no mystery about who is going to do what.

Staffing policies of the department, the third major consideration, are necessarily influenced by its location in the company. Originally, a decision must be made as to the extent recruitment will occur inside the company as well as on the outside. Interwoven in this decision are matters of the skills available within the company and the size of the staff which is needed. Also pertinent is whether or not the opportunity is to be taken to use the department as part of the management training program through a planned turnover of staff. Determining what skills are required is perhaps one of the first things to be done. Whoever is to manage and direct the activity should of course be a seasoned practitioner who himself has been through the mill and can guide his people around the multitude of pitfalls which inevitably lie ahead. He should possess at least all of the qualities he will expect of his staff: leadership and personality, analytical ability and the facility for fluent speech and writing, patience and the will to horse-trade and to get along with all sorts of people, whether or not he likes them or their ideas.

Self-effacing

This paragon of virtue must be ready and willing to give credit to others and to get the job done, soft of voice and velvet of glove, for he has no line authority. His staff, wherever they may come from, need possess little else than does their boss. If they are to be found from the company ranks, well and good. If not, the search must be made elsewhere. There are certain spheres of knowledge which require more lengthy technical training than a company may wish to spend without productivity on the part of the trainee. Most of this knowledge pertains to office equipment, mechanical and electronic. Clerical work measurement and forms design can be taught in less time and with concurrent productivity, although they too are technical in their way.

One further word on planned turnover of the systems staff. Assuming that an over-all company perspective is prerequisite to a managerial position or officership, what better point of vantage for training is there than the centralized organization and systems department? It cuts across divisional lines and provides a top management-eye view of things, a frame of reference to which few other departments have so ready an access. One disadvantage of constant staff turnover to the systems department manager is that he can't train just one set of employees and then sit back and reap his reward. He has to do the training job continually. But maybe this is one way to keep him alert and the staff pipeline circulating with a frequent change of good red blood.

Fourth on the list of major considerations in designing and building the systems department is program planning, which relates directly to the reasons for setting up the department. A program is considered to be the general plan for carrying out the assigned functions of the department. Projects, which will be described later, consist of the detailed work assignments to the staff. Programs should be phased and reviewed periodically with a critical eye toward the need for revisions.

MR. HASLETT has been active in SPA work since the association's inception. A former vice-president of SPA, Mr. Haslett is manager of the Methods and Statistics Department of Shell Oil Company, New York. His paper was given at the Third Annual Systems Clinic of the Pittsburgh Chapter of SPA last year.

Most commonly there are six distinct programs. A typical statement of these programs would read like this:

Office Systems Program

Conduct surveys of procedures and organizational relationships in terms of the practicable extent of standardization, simplification, and production measurement.

Equipment Standards Program

Conduct detailed studies and test makes and models of office machines and equipment for the purpose of making specific recommendations for practical application, proper utilization and economical operation of equipment recommended. Establish basic requirements for the justification of purchase and for budgetary control purposes.

Records Management Program

Develop filing systems and standards for the effective management of records. Develop recommendations concerning the retention of records in accordance with prescribed company policies.

Office Appraisal Program

Follow up new systems installations and periodically review on a comparative basis the effectiveness of office systems, using data derived from the production measurement phase of the office systems program.

Coordination Program

Establish a systematic means of correlating forms and reports with related administrative procedures and coordinate the dissemination of information concerning policies and procedures.

Research and Training Program

Establish and maintain relationships with professional management societies and with other companies for the

mutual exchange of information relative to management improvements in policies, organization, procedures, equipment and methods development techniques.

Develop, by laboratory methods, systems applications to company problems; test the applications; maintain bibliography and file of data representing the most effective proven solutions to typical methods problems.

Prepare training material on all phases of methods work for the systematic use of employees engaged in this field.

Conduct regularly scheduled seminars in systems problems and techniques.

Coordinate activities with all other systems programs.

There comes a time, however, when there is a need for bringing the programs up to date. Last year we reached this point in our firm and here is what we came up with in the way of new or revised programs:

Electronic Data Processing Program

Coordinate throughout the company the development of uses for electronic data processing equipment, to take advantage as rapidly as is practical of the operational and economic activities of the processing of data electronically; conduct research on the equipment and into its proper application throughout industry; assist in applying the machines in cooperation with the offices involved.

Methods Research and Planning Program

On a long-range basis, conduct research into systems applicable to the company's operations; analyze existing methods and develop improvements in company offices; maintain the company system for review and clearance of forms.

Work Improvement Program

Establish criteria whereby offices of the company within existing policies may continue to improve their own work; develop manuals of techniques for simplifying office work which may be used by all to insure the proper utilization of equipment and the simplification of procedures and forms.

Office Appraisal Program

Periodically review on a comparative basis the effectiveness of office systems and processes and assist offices in their use of the techniques of work improvement, including forms and equipment.

It will be noticed that the difference between the two sets of programs is mainly one of emphasis—emphasis in the second set on technological developments and emphasis on getting the operating people toward more self-improvement.

Now for project planning, which, of course ties to the programs. It is apparent that the type of projects undertaken should be governed by those situations that hurt the most. The scope of any given project will necessarily be governed by the size and competence of the methods staff. Another thought which can all too easily be overlooked is the timing of projects in terms of the absorption point of the company. Changes which are too numerous or too frequent cannot be digested by any office, so it is well for the systems manager to guide himself accordingly.

Our final consideration deals with the reporting of progress, and here once more we have several schools of thought. One side contends that the main measure of progress is in dollars and cents saved. The other side claims that the extent of procedural improvements is the significant criterion. In the final analysis, it is probably the attitude of top management which will govern where the emphasis is placed.

To sum up: There is no one best pattern for a systems department. It should carefully plan and balance staff, programs and projects. And above all, the department should be flexible.

One final observation: as progress in other fields becomes more rapid and pronounced, the systems man has a great challenge before him. Not only must he keep himself abreast of that which is happening elsewhere, he must see to it that his own profession is in the vanguard of all managerial progress. **s/p/a**

Reproduction - Getting jobs done right

One solution to the problem of using the proper reproduction process for each job is centralized duplicating with all material to be copied flowing through a single desk manned by a person thoroughly familiar with all processes and authorized to allocate each incoming job to the proper machine.

An alternate solution is one of education which is based on the belief that in most cases where departments request and secure duplicating work by a process not best suited to the job at hand, it occurs because departmental personnel are not aware of the existence of alternate methods. The educational program can be accomplished by a small booklet. In one company the booklet begins with a one-page introduction and definition of purpose. The next section under the heading "General Information" describes the location of each of the processes covered.

Paper stocks available for the different processes are listed and this virtually eliminates orders which require procurement from the outside. A short paragraph defines the manner in which work is to be requested for each process. The remainder of the booklet is devoted to factual data on each process. A format was devised which permitted adequate description of the process and information as to its applications and limitations, master preparation and care, and an illustration, on a single page. This one-page writeup is followed by an actual sample of work done by the process. "*Modern Office Reproduction and Imprinting Methods,*" Arch B. Johnston.

Methods Work in the Military Air Transport Service

by Lem F. Thom

It may be called the Manpower and Organization Office, but it's really the systems and procedures department of the world's largest airline —the Military Air Transport Service. The author discusses its problems from his vantage point at Dover Air Force Base, in Delaware.

AS in any progressive business enterprise, systems and procedures are a "must" in today's operations of the largest airline in the world—the Military Air Transport Service, or MATS, as it is known. Many varied management problems confront MATS in its military air transportation system. There are problems of organization, systems, methods, procedures, costs, allocation and utilization of available resources, and obtaining and keeping trained personnel.

Here at Dover Air Force Base, Delaware, is the headquarters of the 1607th Air Transport Wing (Heavy) MATS. The mission of the Wing is, briefly, to "transport personnel and materiel of the Department of Defense activities." In the Wing, the Manpower and Organization Office is the "systems and procedures" department. On the organization chart, the office is shown in a box alongside that of the Wing Commander who, in private industry, would be equivalent to a president of a concern. The office functions as a special staff activity to the Wing Commander, and is responsible for providing management engineering services which include systems and procedures.

The organizational placement of the office is important, more so in view of the current interest in military air transportation generated by the recent report of the Hoover Commission. As a special staff activity, we keep the Wing Commander and his immediate staff advised on all management matters and maintain specialized and functional relations with line organizations in the field of management engineering.

One of the many aspects of management engineering is procedural analysis which we are developing to cover major functional areas. The most important functional

area of the Wing is, of course, air transportation. Here we are concerned with receiving, in transit storing, loading and unloading cargo on and off our huge transport planes. The method of approach which we use in conducting a procedural analysis and development study may be stated as follows:

1. Informing the Wing Commander as to the nature, purpose, and reasons for the study and obtaining his approval.

2. Informing the line executive and his key subordinates, or in this case, the unit commander and his key subordinate officers and non-commissioned officers. In this instance, a written notification is transmitted to the unit commander informing him of the nature, purpose, reasons, and anticipated beginning and ending dates of the study, including a statement that a preliminary conference will be held.

3. The purpose of the preliminary conference is to clarify the objectives of the study; to explain to the unit commander and his key subordinates how the study will help them in more effective management of their operations; and to attempt to establish harmonious relations with them. This we consider important for two reasons: many a management study designed to improve operational effectiveness has foundered on the shoals of poor human relations; and no matter how effective a procedure may be, if poor human relations exist between the "operators" and the survey team that procedure is doomed to failure at the outset.

4. The next step involved is to establish preliminary planning and background development concerning the study. This we do by researching and reviewing Air Force directives and regulations, previous studies, and other pertinent written material concerning the operations of military air transportation as applicable to MATS bases. We then draft a plan of action and a tentative timetable to be followed. A pre-survey conference is held with the team members at which time the plan of action is discussed and modified.

5. We are now prepared to begin the survey. We personally contact the unit commander and inform him that we are now actually beginning the survey. The fact that we contact the unit commander helps to establish sound human relations to the extent that we operate "through channels." This sets the atmosphere, so to speak, in which the unit commander, as a representative of top management in his own sphere of operations, helps to conduct that feeling of harmony to his key subordinates. They in turn influence the first-line supervisors. This is important for the last-named persons are the "operators" who can make or break a procedure.

6. Conducting the survey begins and we accumulate considerable material concerning the present method of operations. We use standard Air Force forms such as work distribution charts, flow process charts, and task lists. Surveying present methods used involves observing the physical flow of work as well as personal interviews with the operators who are doing the work.

7. The information gathered is sifted, analyzed, reviewed and refined, and is personally given to the operators concerned for review as to accuracy.

8. Upon return of the information, a modification of present methods used is drafted. This is presented, in an oversize chart, to the operators at a conference which explains the comparative advantages of the new procedure over the old one. The conference helps to modify the views of the survey team and that of the operators, and indirectly sells the new procedure to them.

9. The new procedure is written in a format of a management report, including pertinent charts and graphic presentations. The report is transmitted to the unit commander for final review and coordination. A point to be noted here is that the report is fully coordinated with the first-line supervisors, and with the key subordinates concerned before forwarding it to the unit commander. This helps to sell the adoption of the new procedure to the line executive.

I shall not go into details here as to the installation and follow-up of the new procedure. I believe that this is a must for any systems and procedures department.

What I have attempted to do in this article is to explain the functioning of a systems and procedures activity, although it may be known under another title elsewhere, at Dover Air Force Base, Delaware, and at MATS in general. I have also attempted to define the method of approach which the Manpower and Organization Office uses in conducting a systems and procedures study. The approach may or may not be the same elsewhere, but it is our attempt here, as the Systems and Procedures Department, to solve some of the problems facing this largest of airlines. **s/p/a**

MR. THOM has been employed by the U. S. Air Force as a management engineer since 1951. He holds a Master's degree in Public Administration from New York University.

Systems and Procedures — from the Ground Up

by Vincent P. Connolly

This is the concluding installment of Mr. Connolly's article, based on his experience at the Atomic Energy Commission project in Portsmouth, Ohio

Qualifications for Analysts

EDUCATION, technical experience and analytical skill alone do not constitute sufficient equipment for the working personnel of a Procedures, System and Methods Department. We use a generic name for the department in the same way we use analysts to describe the workers therein. Basically the latter are all analysts whether their specialties are time-study, work simplification, job analyses, methods of improvements or special projects for management. Of course, all personnel is "working personnel"; the term here is applied to the man with the clip-board.

The well-qualified analyst truly is a rara avis—as will be glumly attested by any personnel director. His educational specifications have to be written in the broadest terms and they have to be evaluated in relation to natural endowments and his development of them, his experience and his personality. He may be an engineer. Engineering training, generally, develops analytical skill and exactitude. This statement is one of those generalities which may assay higher in glitter than in gold: Something suggested for exploration when the individual applicant is considered. He may be an accountant or an auditor. He may be a Ph.D., an M.A., or a product of the grade school, the library and I.C.S. Some of the last flop, too! In some organizations, the degree is worshipped out of proportion to the attainments it should represent.

The analyst must have an orderly mind. Facts must pass through it and be sorted and assembled with the accuracy of brain-directed tab equipment.

He must have the nose for news of a good newspaperman and copy-desk facility for integrity, coverage, terseness and unmistakable clarity (and an eye cocked at policy!).

He must be able to ferret out the facts. He must not be misled by malice, "ignorance of the law" or self-seeking. He will accept nothing as fact without verification.

He must be a diplomat, yet keep objectively aloof from intrigue and internal politics. He must be a salesman of high order because his stock-in-trade—the plan, the procedure, or whatever the project—is useless until it is "sold" and put to work. He must be selfless to the extent of not caring who gets the credit as long as the job gets done. (His own boss will know, and that should be enough.)

By temperament, as well as conviction, the analyst must be a team man; no place here for grandstanders or prima donnas. In batting practice, it may be all right to catch a pop fly in the hip pocket to show 'em you can do it. Need the allegory be completed?

The analyst must be able to write, which presupposes, of course, that he knows how to think—by the book and for himself. We cannot presume the Ph.D. knows how to write. (If you don't believe it gain access to the files of any university and browse through some of the accumulated dissertations. Some of them are honeys!) The analyst must know how to write to have his reports read—and some action taken. Factual writing need not be drab. Most situations will develop a fact or two that can be dramatized the same as was the report submitted with a proposed procedure:

"$1,132,357.38!

That's what termination inventories cost this company for the year ending December 31, 1952."

The good writer will, by instinct and training, write with the convincing sureness of the advertising copy writer. Your analyst will have the spark, the touch, or he won't.

We've digressed a bit because this is not a treatise on writing. (Ask your librarian to scare up a slim volume by one Aesop Glim* Don't let the author's name fool you—when you've read it, you'll have the writing specifications for your analyst rather well defined.)

If you think your qualified analyst must be a paragon, look at what the chief of an industrial engineering department wrote:

"The analyst must be endowed with awareness, with an ubiquitously inquiring and orderly mind. He must have perspicacity, and shrewdness to separate the wheat of proffered ideas and suggestions from the chaff. He must be an idea man on his own account. His Machiavellian suavity must be the facade for an inexorable will to get things done—the right way. He must have inherent integrity; what he presents as facts must be incontrovertible facts, his quotes must be authentic, limited in scope and acute in their application."

A Simple Aptitude Test for Analysts

The following test was devised to provide minimum insurance against making a blind bargain when employing analysts. Naturally, the results of any test, this one included, have to be measured in the light of the applicant's education, experience, general background, and adaptability. No test, alone, can compensate for poor judgment. The results of this test should indicate an applicant's mental orderliness as well as his writing ability.

Unfortunately, a briefcase full of impressive samples may not tell the story—they may have been written or at least edited by someone else! Comparison of samples with results of the test should indicate the authenticity of the former. The several items may be changed with sufficient frequency so they will not get into general circulation—so the prospective employee could not come prepared with a paper up his sleeve.

"How I Shave" determines the applicant's ability to make an orderly presentation of a simple operation with which he is familiar. Alternatives might be, "How to Park a Car", or "How to Put on Tire Chains", or any other operation with which any applicant would be familiar.

The second phase of the test, rearrangement of scrambled topics indicates the applicant's aptitude for proper arrangement of facts.

The third part of the test, that of preparing a brief paper, "The Characteristics of a Good Report", or some similar subject, would measure the applicant's writing craftsmanship.

The test that follows is given under direction of the supervisor of the department in which the applicant would work, and only after the usual screening by the personnel department. Results are evaluated only by that same supervisor. This test is not to be confused with any conventional aptitude test. It does not attempt to probe the applicant's psychological fitness. Rather it is an extension of the interview to determine the applicant's ability to set up and execute his own projects with a minimum of supervision. Certainly it is not an aptitude test to give a bricklayer a bucket of mortar, a trowel and a pile of bricks to determine whether or not he can build a corner! By these same standards, this test is simply to determine the applicant's skill in applying the talents and personality facets which have been found acceptable by the personnel department.

The Test for Analysts

There is no catch in this test. The work of this department requires a unique combination of skills and ability. Tentative evaluation has been made of your experience and adaptability. Now your fitness will be subjected to a simple test. The results will not be gauged by severely rigid standards: What you write will indicate your skill in describing a simple operation, your ability to sort out and arrange facts. It will be a measure of your ability to write clear, concise and correct English.

No time limit has been set arbitrarily; consideration, however, will be given to the time it takes you to complete the test.

When you have completed all three sections of the test, please turn in your papers, together with this sheet, to the person who gave you the assignment.

Use whatever medium with which you think best—pencil, pen or typewriter. A typewriter is available for your use.

First: Write a description, "How I Shave." This is an operation with which you are familiar. Describe the steps from start to finish so that the process may be understood by one who knows nothing about the nuisance of shaving.

Second: The following words are tags for major and minor topics. Please arrange them in their logical order, giving Arabic numerals to the general topics and capital letters to the minor topics associated with the numerals. For instance, if you found Petty Cash, Accounts Receivable, Accounts Payable and General Accounting, you would arrange them as follows:

1. General Accounting
   - A. Accounts Receivable
   - B. Accounts Payable
   - C. Petty Cash

Some of the topics in the following paragraph will

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* "How Advertising Is Written—and Why"—Aesop Glim, McGraw-Hill, New York, 1945

fall into categories as simple as the example; others may be more complex, and some topics may have no association, in which instance they would simply be numbered.

Here are the topics for you to arrange: Plant Organization, Production Planning and Control, Analytical Methods for Determining Lot Sizes, Policy Manual, Set-up of Purchase Orders, Trial Run Inspection, Fixed Factors in Planning, Functional Inspection, Analysis of Machine Capacities, Detail of Duties, Marking and Recording of Gages, Barth Time Slide Rule, Medical Examinations, Specification Control, Supervisors' Rating Sheet, Machine Loading, Bases for Employee Incentives, Technique of Planning, Price Established by Market Movement, Mechanical Time Records, Glass Precision Gages, Material Handling, Group Insurance, Details and Capacities of Roller Conveyors, Job Evaluation, Budget Organization, Cost Classifications, and, Balance-of-Stores.

Third: write a brief paper, about 200 words, on "The Characteristics of a Good Report." *

An appropriate conclusion might be to offer for consideration the thought that the procedure for Christianity is so adequately expressed in just Ten Commandments.

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* Undoubtedly results would not be satisfactory were the test to be given under conditions other than those described. For emphasis, this test, an interview supplement, was given and evaluated *only* by the department head under whom the applicant would work.

Book Review

"Handbook of Industrial Engineering and Management
edited by W. Grant Ireson and Eugene L. Grant, 1955. (Prentice-Hall, Inc., New York 11, N. Y., 1203 PP. Illus. $16)

Reviewed by V. Lazzaro, Merrill Lynch, Pierce, Fenner and Beane, New York.

It is difficult to realize how broad an area the industrial engineering, systems and procedure, and management fields cover until one sees them presented in a comprehensive manner in a book such as this. While the book is divided into 17 chapters, each is complete enough to be a book in itself. Moreover, each chapter has been written by an authority in his particular field.

The chapters which cover such topics as business organization, managerial economics, motion and time study, systems and procedures and operations research are self-contained. For example the chapter on "Structure of Business Organizations" has 38 sub-divisions, each a capsule presentation of the subject. The authors have used illustrations very freely as an aid in presenting the subjects.

In the chapter on "Factory Systems and Procedures" Mr. Bell, the author, defines a system as "an assemblage of people, devices, and plans for performing an administrative function. All these components are necessary—the people to make decisions and take action, the devices for them to work with, and the plans to guide them and coordinate their efforts." Mr. Bell goes on to explain the make-up of systems, the requirements for a system, how to undertake a system study and other facets.

This handbook can also serve as a ready reference for the industrial engineer and systems man who may be called upon to use statistics, quality control and operations research techniques to solve problems.

Of particular interest is the chapter on "Trade Unions and Industrial Engineering" written by Mr. William Gomberg, a well known authority in this field. The author presents historical information on the subject; the union's relationship with job evaluation, time study, standard data and wage incentives; and other union-management problems such as collective bargaining.

The chapter on "Engineering Economy" should be of particular value to an analyst working on equipment replacement, break-even point problems, return on investment, and other problems related to investment in new plant and equipment. In addition to serving as a good reference for formulas, and interest factors tables, it is a good guide to the procedure to be followed in making economy studies.

The chapters titled "Industrial Hygiene," "Industrial Safety" and "Industrial Climatology," besides being interesting as background information to the well informed industrial engineer and systems man, can also serve as a source of information when needed.

The "Handbook of Industrial Engineering and Management" can serve as an introduction in the areas covered to the uninitiated seeking information about them. Its primary value however, will be its great store of reference material for analysts, engineers and management personnel when working on specific problems.

The fine quality of the volume itself deserves mention. Produced in 2-column page layout on a fine grade of paper, the text is highly readable. The indexing and reference system is another mark in its favor. **s/p/a**

Why Procedure Manuals Differ

by Robert C. Weisselberg

and

Harold M. Bailer

This article is based upon a panel discussion on "Standard Procedure Manuals," given before the Knickerbocker Chapter of SPA.

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Mr. Weisselberg is Methods and Procedures Manager with General Fire and Casualty Co. Before that, he was a member of the office methods staff at Johns-Manville.

Both authors are charter members of the Knickerbocker Chapter.

WHY HAVE a procedure manual? In general, a manual may serve the following purposes:

To control methods of performing work,
To coordinate work among departments,
To guide present employees,
To train new employees,
To train present employees in new tasks,
To tell management how work is done,
To serve as a basis for improvements,
To provide foundation for company expansion,
To insure examination of problems to be proceduralized.

Intangible benefits? Yes—but invariably the tangible savings uncovered far outweigh the cost of writing a manual.

In general, a company should prepare a manual whenever the benefits (tangible or not) will amount to more than the preparation cost.

What should a manual contain? This too is governed by company needs. For example, a manufacturing firm with plants and sales offices at scattered locations will certainly want order and billing procedures for use of sales and production personnel.

Some companies have a manual for clerical procedures only; others include administrative, financial and production instructions. Some firms keep certain instructions (such as industrial relations procedures) in a separate manual. Others attempt to house all written information in one book. The answer seems to depend upon the closeness of relationships among the various functions. For example, if the sales and statistical functions of Company X are so closely allied that employees of one group

To our way of thinking, this is one of the most helpful short articles on procedure manuals that we have ever had the privilege of reading.
—the Editors

must know what is required of the other, they include both sales and statistical procedures in one volume.

Should a procedure manual contain information about company organization? Most companies do not think so. A separate organization chart instead of manual may be preferable. The procedure manual can then avoid pinpointing responsibility for performance of any given procedure. Otherwise, the frequent changes occurring in most company organizations will entail correspondingly frequent procedure revisions.

Organizational Responsibilities—Who shall be responsible for writing, editing, approving, issuing and enforcing the procedures? Here indeed are grounds for lively discussion.

In many companies the methods group will write and edit the procedures, with approval of operating personnel. This may seem to be an expensive approach, since it takes a staff of trained procedure writers to do the job. Yet it insures a uniform writing style as well as a uniform weight to the procedures covered.

Other firms have the procedures written by line personnel which may be edited by the methods group. This approach seems to be less expensive; yet the drain on supervisory time may be more costly in the long run. However, this method enlists the participation of line employees in the work of manual preparation; it makes them feel part of the creative effort. Those employees are more apt to accept the manual as their own, and to abide by its instructions.

Before publication, procedures often require approval by operating personnel. In general, this approval must come from the lowest level supervisor or officer having responsibility for performance of work at all locations covered by the procedure. Some companies may also require approval by the methods manager, treasurer, controller or other officer. The cautious methods man will invariably seek advance approval from the operating supervisor—whether this approval is required or not. Advance cooperation will ensure future compliance.

A touchy subject in many companies is the question of enforcement. In many concerns the methods group is not only the lawgiver, but also the police force. Not an easy road to popularity—to have to enforce procedures. Yet, it is argued, who knows the procedure better than the man who wrote it? Other companies leave compliance as the responsibility of the line supervisor. Let the methods group write the procedure (they say), for it's a staff function—we'll see that it's carried out. Organizationally, this is sound—but many times procedures are ignored by indifferent supervisors. The soundest solution is to assign the responsibility for enforcement to the internal auditors, or a related group. Auditors may work closely with the methods men; none will doubt the auditor's authority to question a failure to follow a procedure.

Organization of Manual Content—The departmental organization in many companies is based upon logically organized *functional* responsibilities. In such instances, there is no conflict between the existing organizational structure and the logical groupings of functions. One major organization has procurement assigned to three major non-operating divisions of the company: the purchasing department for largest number of purchases; the traffic department for automobile fleet procurement; and a separate buying department for the purchase of raw materials (traded on the commodity exchange).

Functional organization of procedures has logic in its favor in that it facilitates reference to particular topics without requiring knowledge of the organizational responsibility, since all facets of a function are grouped together. In such instances a subject index may not be necessary. A disadvantage is that it is not easy to organize all the material that relates solely to a specific major organizational unit, such as the purchasing department just cited.

Need for Cross-referencing

Functional and organizational grouping of procedures leads to the need for cross-referencing of subjects which impinge upon them. If all manuals are not available to all organizational units to follow up the reference, the effectiveness of a procedure suffers.

A third method of organizing procedures is topical. This recognizes the interrelationships of many procedures. The cross-referencing problem no longer exists since procedures can be organized and grouped without regard to organizational or functional relationships. With a topical basis, procedures can be either grouped on a rough organizational basis—to the organizational unit with the major responsibility for the topic—or all grouping can be disregarded. In this latter instance, a subject index is essential for reference purposes.

As previously mentioned, procedures may be organized on a functional, organizational, or topical basis. The purpose of the organizational is to generally follow some meaningful logic. On assigning numerical and/or alpha-

betical codes or symbols to identify the procedure, generally it is desirable to use a system of symbols which is consistent with the organization of manual content and yet provides room for expansion within the framework. For example, one system provides for a six-digit number with the first digit denoting broad organizational groupings; the second, organizational divisions; third, functional sub-divisions within the division, etc. Except for the last two digits, numbers are assigned to procedures strictly in sequence, each digit having a significant use and properly related to the entire structure.

This method is difficult in that it requires considerable forethought in order to establish a comprehensive framework for all areas to be covered by procedures before undertaking the numbering and issuance of any.

Subject Index Needed

A simple method is the assignment of codes in numerical sequence without regard to the topic. As is readily seen a good, comprehensive, up-to-date subject index is imperative in this instance.

A subject index is a handy reference tool and difficult to establish and maintain. Most organizations do not have one. This is understandable in view of the difficulty in keeping procedures themselves current. With a well-organized table of contents the need is not so great.

Organization of Specific Procedures—It is desirable, if possible, to have a procedure in which each step follows in proper sequence wherever it may go, as well as one written specifically for each desk. Both have their virtues. The process flow covers the entire picture, shows all activities in their proper relationship, whereas the desk type confines itself to the particular instructions to a clerk on the performance of a specific task. For training and most operator reference, the latter is preferable. The flow process procedure simplifies the job of maintenance in the reflection of procedural changes.

Generally it is difficult to maintain the currency of a procedural approach. Thus, the process flow type appears to be the best all-around technique. A disadvantage to the clerical user is his need to locate the applicable sections for his responsibilities and to disregard the rest.

One compromise may be the use of flow diagrams for the overall procedure with the detail procedures set up on an individual desk basis.

Broadly speaking, a basic function can be considered a topic unit and at the other extreme an individual paragraph can be considered a topic. This is hard to define. The smaller the topic or procedure unit the more closely a flow process technique approaches that of the desk type procedure. On the other hand you lose the advantages of showing the broader implications of a procedure. One organization tries to hold all procedures to two or three pages. Other companies have procedures as large as 15 pages each.

There are advantages of control and cost through "de-skilling" the job in detailing the procedure. As offsets there are the problems of bulkiness and consequent difficulty of reference. Difficulties of maintenance of the manual are compounded, for all changes, however slight, will call for alterations in the manual.

The cross indexing in a procedure (either to another section of that procedure or to another procedure) is technically an efficient way of handling the reference. For one thing, it does not have to be altered even when the content of the reference is changed. Secondly, it helps keep down the bulk of procedures. But if used frequently it forces the person using the procedure to break the continuity of reading and locate the reference, and then return. It is an effective tool but can be overdone.

Many times people with broad technical or management responsibilities have need to get the general picture of a large area that is covered by several procedures. Internal auditors, public accountants, staff personnel, new supervisors, controllers, and the like frequently have such a need. For such purposes it is frequently necessary to preface a group of long and involved procedures with a synthesis that also integrates the problem with related areas.

Policy Manuals

Many organizations have policy manuals. Others enunciate their policy in a series of memoranda over a period of time. Should such policy be incorporated in procedure manuals? We think it should, even though there be a policy manual. For one thing, any valid procedure should be consistent with the policy bearing upon that procedure. Where procedure provides for certain latitude of judgment such exercise can best be made by incorporating the policy statement within the procedure, perhaps in the general statements frequently found at the beginning of procedures.

Should a procedure direct action alone, or should it in addition tell in certain instances why? Confining it to direct action contributes to brevity and facilitates reference. "All I require is that they know what to do," is frequently heard. Others say, "How long can you expect them to operate effectively unless they know why?" The "why" connotes respect for employees and the act of taking them into the company's confidence. It can also better train people for other related positions.

Mention has already been made of the possible use of flow charts in conjunction with desk type procedures. One major company uses diagrams and flow charts as the almost exclusive medium of procedures. There are advantages in their use. Yet for general clerical use it is a

medium most people are not familiar with. Such unfamiliarity may discourage its effective use.

Studies of the physical mechanics of reading printed matter have indicated that a person can read or absorb a line at a glance if the line is not in excess of 5 or 6 inches of pica type. It is used as justification for limiting lines to that length. The margin spaces left can then be used without fear of waste. Many companies use one margin for topical subdivisions to facilitate reference for a particular topic. The other margin can be used to identify the organizational unit responsible for each portion of the procedure.

A forms manual or forms in the procedure? Most people agree that the forms preferably belong in the procedure. It is also recognized that this is another factor, like detailed instructions, that gives rise to frequent procedural revisions. Having available in a procedure the form referred to helps the user considerably. It also helps to insure that changes in both procedure and forms are properly coordinated.

It would be desirable to illustrate the form each time reference in a procedure is made to the form. However, even in lengthy procedures it is more practical to append all forms referred to in one section.

It is logical to write in the procedure the instructions for filling out the form. Experience has convinced many that it is simpler and easier to understand when instructions are shown on a sample form carrying typical entries.

To sum up, there is no single, simple answer to who should write the manual or what it should contain. But if you will think these many problems through, in light of the company's specific needs, chances are you'll come up with a top-flight approach. **s/p/a**

"A letter or memo costs less than a private wire of the same length sent any distance.

"A 100 word letter costs less than any length domestic telegram sent any distance.

"A 100 word letter costs less than a 3 minute telephone toll call of any distance, except below 50 miles." —C. I. Keelan, "How Much Does It Cost To Communicate" The Office, **September, 1954.**

A Manager's Stake in Systems

You Can Go To Town—With a System

No. 5 of a series by Leslie Matthies

SOMETIMES a man says, "We've got to cut down that overhead," or "Burden rate is out of line," or "Too much paperwork around here."

The man is talking about a common administrative problem, yet what is there to get your teeth into?

How different is the systems approach! With systems analysis you can *pin down* an exact operation, then find out:

1. Your actual *cost* for the operation.
2. How much *useful work* you get.

A systems analysis will also tell you:

1. What it *should* cost you.
2. How much useful work you *should* get.

What is more, your systems analysis will show you, in detail, exactly *how* you can cut the cost. Your systems man will show you how much useful work you can get by following his recommendations.

You don't have to get into the details—your systems analyst will handle all that. He will check with your operating people, design the forms, specify the machine, train the operators.

In short, he will also *install* a system for you.

Finally, after a few months of operation, he'll report back to you on the actual results.

If you want him to, he will tackle each of your operations in a similar manner. When he gets through, you'll have a lot of snap and tone in your outfit—and you can go to town with effective control and lower costs.

No manager would ever knowingly decrease any systems benefit. He wants lower costs and better control.

> Yet, systems analysts have observed that sometimes systems results are "watered down" because of what the bosses do, or don't do.

Any executive's action that decreases the value of his systems operation, is always done unknowingly. In our next message, we will try to point out how the executive can get the most out of systems work by avoiding certain common pitfalls.

Organization Planning—

What It Will Do for You

by R. C. Campbell

EMPLOYED by the Cleveland Electric Illuminating Co. in 1946 as a personnel assistant, Mr. Campbell's subsequent assignments have included direction of the company's Union Relations Section and general supervisor, Personnel Planning Section. These days he is responsible for the direction of staff activities in organization planning, management development, wage and benefit administration, personnel records, and personnel research.

Mr. Campbell finished his wartime service as Quartermaster Personnel Officer, U. S. Army, at the Philippine Army Base in late 1946. His university record—AB degree, Ohio Wesleyan, 1942; degree of Industrial Administrator, Harvard Graduate School, 1943; LLB from Cleveland-Marshall Law School, 1951.

ORGANIZATION planning has been defined, facetiously of course, as "organized confusion." A more serious definition is this one by Alvin Brown, vice-president of Johns-Manville Corporation: "Organization defines the part that each member of an enterprise is expected to perform, and the relation among those members, to the end that their concerted endeavor shall be most effective for the purpose of the enterprise. . . . ." Note that organization is concerned with two things: what people are expected to do, and their relationships one to another.

The people who are concerned with organization planning and the systems analysts have a great deal in common. First of all, they have common objectives, that is, trying to provide that framework within which men are free to make the best use of the men, materials and time at their disposal. Both groups perform staff activities and consider themselves as service people, rendering essential services to the company. And, finally, systems work and organization planning are both relatively new specialties. Therefore, both are pioneering to some extent. The importance of organization planning, as a part of the management process, was not fully recognized until after World War II. Even today there are many companies which pay little or no formal attention to organization planning.

Those who perform systems analysis work have a real concern with organization planning. Many of the problems they attempt to solve have their root in organization.

Because many companies have no organization planning staff, organization planning is carried on by a number of top line executives. In such cases, knowledge of organization principles is both a necessity and an opportunity.

Let's start with a few basic fundamentals about business in general. Every company has three basic resources to work with: men, materials, and time. The only really

Organization planning has yet to reach its fullest application in the management process. Systems people will do well to orient themselves in this study, for its objectives are common with many of the objectives in systems work.

dynamic resource of these three is men. Men must be motivated if they are to effectively use materials and time at their disposal. Motivation requires incentives. Incentives, to be really effective as a source of motivation, must be based upon accurate measurement of performance. Measurement can be facilitated or hindered by organization. This is because organization determines the degree of accountability which can be measured.

One of the best measures of performance is money. Money is a common denominator for any kind of operation. Accounting, which is concerned with keeping track of income and expenses, can also play an important role in maximizing accountability. This is where systems analysts come into the picture. Many spend a great deal of time on accounting procedures which result in substantial contributions to their companies by setting up accounting procedures that maximize accountability. Keep in mind that the objective is to charge to an element as much as possible of the expense incurred by it or by others in support of it. In this way those managers who do the best job can be more readily identified and rewarded accordingly.

Here is an illustration of the importance of accounting procedures in motivating people. It also illustrates the tie-in between accounting procedures and organization: An industrial firm had a number of highly secret government defense contracts. It was, therefore, necessary for strict security measures to be taken. A central protection agency was set up to supply guard service to individual plants at their request.

Within a year, 100 guards had been employed and assigned to the plants. They were attached administratively, however, to the central protection agency. Their salaries were paid not by the plants but by the central agency. There was no redistribution of expense to the plants.

Top management began to suspect that the protection requirements indicated by the plant superintendents were not realistic. They questioned the necessity for a central agency because of the extra supervision and staff people required. It was announced, therefore, that the guards would be assigned to the plants, their salaries paid by the plants and that the central protection agency would be dissolved.

Within six months, the plants had revised their estimates of the number of guards required down to a total requirement of 60, or 40 less than before. By the time the actual organization change took place, this requirement had been reduced to 40 guards. The explanation is obvious. Once the plants were required to pay for the guard service, their estimate of the amount of guard protection necessary declined rapidly.

It is true that there was an organization planning gain here in eliminating unnecessary supervision and staff, but there is another important point also: many of the benefits could have been obtained without any change in the organization. It would have been necessary only to provide a re-distribution of the cost of plant protection to the plant accounts. This would have made the plant superintendents feel that their estimated requirements would have to be much more realistic. Systems analysts can make a substantial contribution in situations like this.

Some Case Histories

Here are a couple more examples of the close relationship between systems work and organization planning. Not long ago a large manufacturing company was confronted with a special production control problem. Systems analysts were called in to help straighten things out. What had happened was that customers' orders were being mysteriously delayed, to the detriment of the company's reputation. The processing of customers' orders involved the following: Salesmen received orders directly from customers in the field. They transmitted them to the engineering staff. When the product was designed to fill the customer's requirements, engineering sent the blueprints to manufacturing. The latter then proceeded to make the product, following which traffic representatives arranged for delivery.

The systems men readily recognized that some overall expediting or control activity was necessary to obtain maximum speed in filling orders. When they suggested that such an element be set up in the manufacturing department, the engineers objected immediately, as did the sales people. Each agreed that production control was essential, but each thought that he should have the responsibility for it, or that it should be under one of those having responsibility for filling customers' orders.

At this point the systems people called on the company's organization planning staff for help. They arrived

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Mr. Campbell's paper was presented at a Cleveland Chapter meeting earlier this year.

at the conclusion that the company was not organized in such a way as to facilitate production control. It would be theoretically possible for the head of that activity to report to the president, to whom the engineering, sales, and manufacturing heads also reported. The president, however, was overburdened already, since, altogether, 12 people reported to him.

After long and careful study it was determined that it would be necessary to decentralize the company along geographical lines in order to expedite customers' orders. Six districts were set up, each of which was headed by a district manager. Under each manager were sales, engineering, and manufacturing heads as well as a production control specialist.

New Procedure Developed

The systems expert developed a procedure for use by the production control specialist. The new, very simple, procedure enabled the production control specialist to keep the district manager informed concerning the progress of each job. The manager was able to check to make certain that necessary coordination of effort occurred in a way that the president could not possibly have found time for.

Results were excellent. Coordination of effort was greatly improved. Service to customers improved with the result that revenues shot up rapidly.

The point of this illustration is the close relationship between organization planning and systems work. An underlying organization problem made the systems analyst's job of improvement almost impossible of accomplishment. When the organization problem was recognized, the systems analyst was able to make his essential contribution.

Organization planners are equally dependent upon systems analysts. A perfect plan of organization, if there is such a thing, can fail miserably unless its operation is implemented by systems. For example: one large company decided not long ago to delegate a greater portion of the responsibility and authority for making decisions and taking action down to lower levels of supervision. This was announced to the employees with great fanfare. "From now on," trumpeted the company's communication media, "we want more of the decisions to be made at the level where action is required."

This was all to the good. In a large complex corporation, delegation is plainly necessary. There are just too many decisions to be made and actions to be taken for one or two men to handle them.

The company neglected, however, to change its systems involving the exercise of responsibility and authority. The signature of a vice president was still required on any purchase order of $500 or more. First line supervisors were still unable to hire and fire their own employees, or even to sign requisitions for new employees, and so on. The organization planners' dream of delegation was just that. On paper it looked fine, but there was more paper needed: the revised procedures necessary to implement the organization plan.

Fortunately, this company realized its mistake before much harm was done, and wrote into being the philosophy of delegation which had only been a theory before.

Now let's turn our attention to the origins of organization. At first, each man worked only for himself and his family, and provided everything required. As he grew more civilized, he became more friendly with his fellow men. He learned that specialization can make it possible for everyone to have more of the essentials of life. One man could devote all of his work time to hunting; another could specialize in the construction of rude huts; and women could fashion rudimentary clothing from skins of animals.

Moses received some very good advice on organization from his father-in-law which is set forth in the book of Exodus.

> ". . . When Moses' father-in-law saw all that he was doing for the people, he said, 'What is this that you are doing for the people? Why do you sit alone, and all the people stand about you from morning till evening?' And Moses said to his father-in-law, 'Because the people come to me to inquire of God; when they have a dispute, they come to me and I decide between a man and his neighbor, and I make them know the statutes of God and his decisions.' Moses' father-in-law said to him, 'What you are doing is not good. You and the people with you will wear yourselves out, for the thing is too heavy for you; you are not able to perform it alone. . . . Choose able men from all the people, such as fear God, men who are trustworthy and who hate a bribe; and place such men over the people as rulers of thousands, of hundreds, of fifties, and of tens. And let them judge the people at all times; every great matter they shall bring to you, but any small matter they shall decide themselves; so it will be easier for you, and they will bear the burden with you. . . ."
>
> "So Moses gave heed to the voice of his father-in-law and did all that he had said. . . ."

This is the gospel on delegation.

Through the years, as man became more adept technologically, organization became of increasing importance. One man started to make "widgets." At first, his business was small enough that he could handle it all alone. He used his own funds to buy the materials. He put together the "widgets" in his own basement workshop. He himself sold the "widgets."

In time, his business grew. He found that he could no longer perform all of the jobs himself, so he hired someone to keep the accounts for him. Another person was hired to put the "widgets" together and another person was necessary to serve the increasing number of customers.

Now he had an organization. There was the president who had founded the business. He had delegated some of the responsibility to three subordinates. Communication became of increasing importance. There were lines of communication, of course, between the president and each of the subordinates. There were also lines of communication, though, between each subordinate and each of the other subordinates. And so the founder discovered that organization gave rise to problems that had not existed when he did everything himself.

Multiply the number of people involved by a thousand or two thousand or one hundred thousand and you get some idea of the organization complexity of American corporations today. In addition to sheer numbers of employees, involving a geometrical increase in the number of communication lines necessary, additional complicating factors in recent years have been introduced by the growth of government intervention in business and the increasing power of labor unions.

Through the years a number of fundamental principles of organization have become identifiable. Organization principles, like any other principles, are intended to serve as guideposts, not as strait-jackets. A principle may be departed from but always for sound reasons.

The interesting thing about these principles of organization is that they must, of necessity, serve only as possible guideposts, since they are, in part, mutually contradictory. Let's run through the most important ones.

First Principle

The first principle is that of stating the objectives of the enterprise. It seems incredible that activities involving the efforts of thousands of employees and the expenditure of millions of dollars would be undertaken without the existence of a simple statement of the objectives of that business. Such is the case, however, in many, many companies. Objectives are, or should be, the keystone for all policies. They are also the foundation, or should be, for all activities. The simple act of writing down company objectives has often led to the elimination of whole departments and divisions. Good systems analysts are always very careful to define and evaluate the objectives of each and every study they make.

Objectives are very similar to ideals. They are seldom attainable in a short period of time, if ever. We are always striving to attain them, and sometimes we come closer to attaining them than we do at other times. They provide the framework to which we should relate all our effort.

The next principle is that of clear definition of responsibility. Having determined what activities are necessary to meet the objectives, it then becomes necessary to allocate the tasks among organization elements and positions. You have experienced, I am sure, the frustration of not knowing what is expected of you in a particular situation. For example, let's say that your company has a coffee break every morning. You and another fellow each are accustomed to going to the company cafeteria and bringing back coffee. That's duplication of work. One day you decide to save time by having only one person get coffee for both of you. For a while this works very well. Then one day each of you goes to the cafeteria and brings back two cups of coffee. This is overlap of responsibility. And one day both of you sit at your desks thinking that the other one will go down to get the coffee. This is underlap of responsibility.

Like a Jigsaw

All of these—duplication, overlap and underlap of responsibility—are bad. Responsibility is like a jigsaw puzzle. All of the pieces must be clearly separated, and yet must be capable of being fitted together into an integrated whole, with no pieces left over or missing.

One of the perennial problems in organization is the grouping of activities within organization elements, and under the various positions in the elements. Many experts on organization advise you piously to group "like" activities, but fail to specify in what respect they should be "like." Activities may be like in terms of level of skill required, kind of skill required, facilities required, occurrence as consecutive parts of a process, or need for coordination because they are taking place at the same time.

Most of these kinds of "likeness" involve *the principle of functional specialization.* We all know what the functional specialties in business are: accounting, purchasing, finance and, of course, systems work, to name just a few.

Functional specialization has a number of advantages: it permits people to learn more about a particular subject than they would otherwise be able to learn. It avoids duplication of staff and equipment. It leads to greater uniformity of decision.

Most companies are organized initially on the basis of functional specialization. Typically, there is a vice-president for manufacturing, a vice president for finance, a vice president for marketing, and a vice-president for certain other staff functions such as legal, public relations, and personnel. This type of organization is admirably suited to small and medium size companies. For larger, more complex companies, however, this type of organization may have diminishing value. The chief ex-

ecutive may have difficulty in making his influence and thinking felt down through the organization. Or, it may be, his span becomes so great that he exerts diminishing influence at even the level next below him.

Many such companies have been guided by the principle of decentralization. This involves the setting up of a number of businesses within the business.

Decentralization takes two principal forms. One is that based upon products or processes. An example of this is the General Electric Company, where each major product group has been set up as a separate element. The distinguishing feature of decentralization is that each decentralized component is practically a company within itself. Thus in General Electric, each product group is a separate profit and loss center. The manager of each business knows from his own profit and loss statement how well his business fared during the preceding year. His compensation, and that of his employees is geared to the financial results obtained.

Decentralization

The other kind of decentralization is that along geographical lines. Typically, a district manager is responsible for all operations within his district. In other respects, this is much the same as product decentralization.

The principal advantage of decentralization is that it provides competing profit and loss centers. When results can be measured in a comparable unit of value—dollars—competition is stimulated. The result is often better operation at lower cost.

There are two important things to keep in mind about decentralization and functional specialization. The first is that both are sound ways of organizing, depending upon the particular circumstances. The second is that almost every company is organized in each way at some level of organization. The company that is decentralized along product lines will frequently have functional specialization at the level reporting to the product manager. Similarly, it is a rare company indeed which does not have some form of decentralized organization, such as sales districts.

Another important principle is that of balance. This is one of the easiest ones to understand, but a most difficult one to apply. If a company has an important public relations problem, it probably should have a large public relations staff. If it has few public relations problems, a small staff is probably ample. There are also, generally, one or more dominant elements in a business. They are the activities that put the business where it is today. In some companies the dominant activity may be finance; in others, sales; in others, engineering. If you can identify this dominant element, it will be helpful to you in your systems work.

Now let's switch our attention to another oft discussed principle, that of *delegation.* You recall the example of the company which talked about delegation but did little to put it into effect. We have seen that delegation has become particularly essential as corporations grow in size and complexity. The one-man, "genius" type of organization just can't do the job any more. At the root of the matter is the need for decisions to be made at the action-taking level. There just isn't time for recommendations to filter up to the "old man" and for his decisions to filter down. When the decisions are made at the action-taking level, the top executives have more time to plan, more time to analyze performance. Delegation does, of course, require a larger number of better grade people. Super-clerks are adequate subordinates for an executive who tries to make all the decisions himself. Effective delegation, however, requires that the people delegated to have the necessary capacity to take on greater responsibility.

There are two other important things to keep in mind about delegation. The first is what we might call the *principle of commensurate authority and responsibility.* Sound delegation requires that the person to whom a function is delegated must have the exact amount of authority necessary to fulfill the responsibility entrusted to him.

Another principle affecting delegation that is of extreme importance is this: *The responsibility of a superior for the acts of his subordinates is absolute.* This is, again, quite elementary, but none the less quite basic. It means simply that delegation of responsibility does not relieve the superior of the responsibility for the delegated activity.

Who's Inefficient?

Let's relate it to business. Not long ago a salesman for a large manufacturing company unnecessarily antagonized the purchasing agent of one of the company's largest customers. The result was the loss of a large order. The president of the manufacturing company called in the sales manager and asked him for an explanation. The sales manager said that salesman "X" was inefficient, that he had been doing a poor job for some time.

The president asked the sales manager, "Who hired X?"

The sales manager said, "Why, I did."

"Who trained X?"

"I did."

"Who had the authority to fire X and didn't do so?"

"I did."

"Then who's inefficient?"

Two clearly related principles of organization are

those having to do with *depth and span of control.* Depth is the number of levels of supervision between the president of a company and the people who perform the necessary manual or clerical operations. This is often called the chain of command, and the levels are referred to as links in the chain. Generally speaking, it is desirable to have as few links in the chain as possible. Each link requires an additional communication. Each communication results in a delay: in obtaining a policy decision, in communicating a work order, or in reporting progress. Communications are less and less accurate as the number of links in the chain increases.

Span Is Limiting

The limiting factor on depth is span. Here's a good example: If there are thirty first line supervisors required and no limit for span is established, only one additional link of chain is necessary. This is obviously impractical, however. What, then is the optimum span? There is no pat answer to this question. Some of the factors affecting it are the variety or lack of variety of activities supervised, the ability and capacity of the supervisors, and the ability and capacity of the subordinates. In most companies, optimum span averages between four and eight subordinates. Just as the objective would be to keep the chain of command as short as possible, it should be, conversely, to keep the span as broad as possible. It is apparent that the broader the span, the shorter the chain of command is likely to be.

One of the great advantages of broad span is that it virtually compels delegation. The executive who must supervise eight people heading up eight different activities simply can't make all or even most of the decisions for them.

The last principle is that of *line and staff separation.* Line and staff are two of the most used and most misunderstood words in business today.

Charles F. Kettering, the General Motors inventive genius, once defined line and staff in these terms: "The line people do the work, while the staff people try to keep them from doing it!" Here are some more serious definitions: Line elements are those which are essential and vital to the achievement of the objectives of the enterprise. In the "widget" company, the line elements were manufacturing, finance, and sales. There could be no business without a manufactured product, without the money necessary to build a plant, buy the materials, and pay the employees. There would be no business without the sales force to sell the product.

The other elements in the "widget" company were staff. They assisted the line elements to meet the objective of the enterprise. One of the staff elements was personnel. Manufacturing, sales, and finance could handle their own personnel activities. They found it worked better, however, to have a company-wide staff personnel service. The principal advantage was that of specialization. Where no one of them could perhaps afford to pay for a full time wage and salary man, together they could afford a good one.

An additional reason for separating line and staff is to keep staff out of the decision making process. Staff people, because they are experts in their fields, tend to exert undue influence in line decisions. If staff people are put in separate elements, it is easier to identify and maintain their roles as advisers and counselors of the line.

A greater understanding of organization planning could be gathered by referring to the American Management Association study by Ernest Dale, titled "Planning and Developing the Company Organization Structure."

These are the cardinal principles of organization:

1. Stating the objectives of the enterprise
2. Clear definition of responsibility
3. Functional specialization
4. Decentralization
5. Delegation
6. Commensurate authority and responsibility
7. Responsibility of the superior for the acts of his subordinates
8. Depth and span of control
9. Line and staff separation

A system or an organization plan is static until people make it dynamic. The best system or organization plan is one which is ideal in the sense that it enables the people in the organization to work together most effectively and with the greatest amount of personal satisfaction in their work. We must not forget that systems and organization are people, in the final analysis. **s/p/a**

Tidal Wave

The 175 billion pieces of paper mass-produced and processed annually in the nation's offices preempt from more productive use thirty-five billion dollars in clerical and executive salaries. Bringing this giant tidal wave of paperwork and costs under control is possibly the greatest challenge confronting top management of both industry and government. It is a matter of serious concern whether our economy can afford the luxury of one office worker for every two factory workers, one office worker for every farmer, or one and one-half clerks for every salesman.—Emmett J. Leahy, speaking at the Third Annual Conference on Systems and Procedures, San Francisco, April, 1954.

The Office Manager's Challenge

by Charles B. Shafer

THE OFFICE MANAGER is in the best position to accomplish office improvement and economy. Yet, while it is considered his responsibility to make improvements and effect economies in the office, his efforts to carry out this responsibility are often sporadic.

Among the chief reasons for this are the lack of an established plan for the office manager to carry out these responsibilities, and the indifference shown when the effort is made.

To explore this situation a typical question one may ask office managers is: "Assume there are two office managers who are responsible for identical offices and all factors are alike. What would happen at the end of five years if one office manager accomplishes substantial improvements and economies and the other office manager continues to run the office without making any significant changes? Would the office manager making the improvements and economies receive a higher salary?" A reply frequently advanced is, "No, he would not."

An office manager is evaluated on his ability to get the work performed on schedule, to keep errors and irregularities at a minimum and to maintain harmony among the employees. If he has a minimum of unpleasant situations and the work is done on time, he is considered to be a good executive. The fact that he has not made any significant changes in the operations of his office in the last ten years is overlooked.

In many instances the office manager has more clerks than he actually needs; he knows this and even admits it. He justifies their presence by claiming that they are needed for vacations, unusual absenteeism and special assignments demanded of his office. While such coverage is to be recognized too many office managers go beyond what is needed. As an illustration, several years ago an office manager was asked, How many clerks could he eliminate from his office if he were actually required to do so. Without hesitation he set the figure at 10.

In many procedural studies where economies have been effected, the office manager has commented that a

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Operating economies and improvements are the responsibilities of the office manager. Does he rise to this challenge consistently? Or is he so deep in the rut of routine performance that only the emergencies stir him to action. The author has a formula for action and results.

portion of the economy was really surplus employees. Not so long ago a management consultant described a survey that he had made to a group of business executives. He pointed out that as a result of thorough studies a reduction of six persons was made in a particular unit. About a year later, after the management consultant was through with his survey, an additional reduction of four employees was achieved by the office manager himself. There was no doubt in the management consultant's mind that the four could have been released at the time the survey was being made. The office manager would not concede the point, because he realized this potential saving and planned on accomplishing it himself in order to receive the recognition.

The point I am trying to make is that there is much needless and inefficient work being performed in the office that can be uncovered by the office manager.

To illustrate, a manager discovered recently that the sorting of checks into a certain sequence for the benefit of another office was no longer necessary. The other office had changed its procedures, and as a result, the sequence of the checks was no longer important. How did the office manager discover this? He was analyzing his operations in the handling of checks to determine if any improvements could be made. This discovery alone saved five clerical hours a day.

In another instance an office manager wondered about the length of time it took a certain type of document to be processed in his office. There are four operations in the process, each one performed by a separate employee: (1) assemble the file, (2) determine the action required, (3) type the forms, and (4) check the work done. He initiated a study of the time required to handle each document processed during a period of several weeks.

The results of the study amazed him. Approximately 12 hours were required for a document to get through these four operations—although the total time spent on each document to process it was about 1½ hours. What happened during the other 10½ hours?

It was determined that each employee was deliberately holding a backlog on his desk to appear busy and to show that he had enough to do. Thereafter, work was distributed in a production line manner and the supervisor watched the work habits of each employee more closely.

In order to have office managers take an active and continual interest in office improvement and economy, it is essential to establish a program that is as important to the office manager as his budget. Such a program might be titled: "Office Improvement Program." The program would involve the following:

1. Annual Plan and Schedule
2. Monthly Progress Report
3. Annual Summary Report of Results

The Annual Plan and Schedule is developed once a year by the office manager. He determines in his own mind what phases of his office responsibility he would like to study during the year. He decides how and when he would like to make such studies. To assist him in making this decision, he would have the knowledge acquired from conferences on work simplification and clerical training. Among the items he would consider for study are the following:

1. Clerical operations
2. Clerical performance
3. Office equipment
4. Forms
5. Work flow
6. Work distribution
7. Office layout

Naturally, in one year he would not be expected to study all of these items under his jurisdiction.

Having made his decision, he prepares the Annual Plan and Schedule. This may be a form providing space for each of the above mentioned items in which to describe what is planned and when it is to be done. For illustration, in the space on the form for office equipment, the office manager indicates that he plans to study the adding machines, and in scheduling this study, he indicates that in January a record will be prepared of what is actually being done with each adding machine in his office. He may discover during this study that he has more adding machines than he actually requires. For February he indicates that discussions will be conducted with the representatives of the adding machine companies for the purpose of learning more about adding machines, their various features and their proper use. As a result of his February efforts, he may discover that certain features of the machine are not being used by the clerks in their work or a better type of machine is available for the work that his clerks are doing. For the first situation, he would give his clerks more training. For the second situation, he would provide in his budget for the acquisition of the better type of equipment. For his March schedule he indicates that he will prepare a report on his findings.

Similar comments are to be entered on the Annual

Plan and Schedule form for those other phases of office activities that he has decided to study during the year. Naturally, some of the commitments would not be scheduled until the middle of the year, after other commitments are completed.

This Annual Plan and Schedule form is then submitted to his boss for discussion and approval. The boss may decide that the Annual Plan and Schedule undertakes too much or too little and suggests to the office manager that he either add or delete some of the items in the plan. Once his boss is satisfied, he indicates his approval after which the office manager is expected to follow the Annual Plan and Schedule just as he would adhere to the annual budget.

Each month the office manager submits to his boss a Monthly Progress Report which describes the accomplishments as required by the Annual Plan and Schedule. For illustration, if he had recorded in January what is being done with each adding machine in his office, he would indicate this accomplishment in his report. On the other hand, if he had covered only two-thirds of the adding machines, he would indicate this in his report and explain why the other one-third was not covered. Such an explanation may be sickness or interruption because of a special assignment.

At the end of the year, the office manager prepares an Annual Summary Report of Results, in which he describes what was planned, what was done and what was not done with an explanation as to why it was not done. Generally, anything that was not done as planned should become part of the next Annual Plan and Schedule. Also, this report would describe and evaluate the improvements and economies made as result of the studies.

These reports are of great value to the office manager in several respects. He has an organized and approved method for developing improvements and economies in his office. He has created for himself a sense of direction. He knows in advance what he is expected to do during the month. He finds it difficult to put off until tomorrow the study that he has already committed himself to do today, especially since the commitment was made to his boss. Furthermore, he knows that his accomplishments become known to his superiors and become part of the records of the company, thus, proper recognition will be forthcoming.

Such a program gets the office manager out of the rut he has created for himself by confining his interests to the daily routine of turning out the work. This program requires him to look at his operations, think about them and search for the improvements that might be made. Furthermore, he can demonstrate to his boss his managerial talents for planning, scheduling and distributing the work load so that it is no longer necessary to carry employees in excess of his requirements. While it is recognized that there are techniques for systematic analysis of office operations which assure the best results from the study, it seems that the first step is to get the office manager to devote time to the study of his operations. By installing this program, it makes the effort worthwhile to the office manager. **s/p/a**

Bibliography of 1955 Quarterlies

Vol. 6, No. 1 February, 1955

Records Management—General Services Administration

Frustration—*Richard Neumaier*

A Manager's Stake in Systems—*Leslie Matthies*

Controlling Machines, Equipment and Forms—*V. H. Roman*

A Public Utilities Man Looks at Volume Billing—*Francis G. Awalt, Jr.*

Multiple Station Dictating Can Save Money—*F. J. McCarthy*

Why Not Sampling Inspection in the Office?—*L. A. Malone*

Mechanized Reconciliation of Bank Accounts—*Raymond C. Kolb and George W. Frey*

Vol. 6, No. 2 May, 1955

Office Machines—Records Maintenance, Testing, Selecting—*C. C. Cather*

Punched Cards and the Systems Man—*John C. Peters*

Procedures and Systems—from the Ground Up—*Vincent P. Connolly*

Mechanization of Accounts Payable—*Andor Beretvas*

Why Not Annual Meter Reading—Averaged Interim Billing?—*R. J. Neubert*

Vol. 6, No. 3 August, 1955

A Single-Column General Ledger Account Form—*Howard C. Greer*

Electronics, Its Possibilities and Limitations—*Virgil F. Blank*

Systems and Procedures—from the Ground Up—*Vincent P. Connolly*

Forms Control Pays off Early—*C. J. Costello*

Conference Leadership—*Kenneth Penny*

Vol. 6, No. 4 November, 1955

The Systems Department—Its Design and Construction—*John M. Haslett*

Methods Work in MATS—*Lem F. Thom*

Systems and Procedures—from the Ground Up—*Vincent P. Connolly*

Why Procedure Manuals Differ—*Robert C. Weisselberg and Harold M. Bailer*

Organization Planning—What It Will Do for You—*R. C. Campbell*

The Office Manager's Challenge—*Charles B. Shafer*

Forms Control—*John L. Primm*

FORMS CONTROL

by John L. Primm

THE SUBJECT of "Forms Control" is a matter of "Management Control," and unless your forms are controlled, I doubt seriously whether management is in control. This is not an easy task, because in this age of constant change in our methods, machines, and materials, more and more time should be spent studying our forms.

At one time I worked for a manufacturer of livestock feed. One of our slogans was, "It's in the Bag," and day after day we tested the ingredients that went into the bag in order to determine that the product met prescribed specifications and standards. Likewise, in our offices, we should have standards, and one good way of testing these standards is to have an effective and practical forms control program.

Thomas Henry Huxley said, "If a little knowledge is dangerous, where is the man who has so much as to be out of danger?" When I think of what improved forms can do in our offices, I know of no question that stirs my imagination quite like this, and, I dare say, the time will never come when we can be satisfied with our forms nor with our knowledge of them.

In considering forms control we should include all printed and duplicated forms, stationery, column pads, file folders, labels, envelopes, index cards, rubber stamps, and any other media which may become a part of the records of an organization. All of these items play an important part in our offices and the omission of any of them may impair the effectiveness of a forms control program.

"The Bureau of the Budget estimates a ratio of $1.00 for forms to $17.00 for their processing as the cost to industry generally. And yet, management is prone to think in terms of the expenditures for printed forms rather than the far greater cost arising from their processing the resulting errors of omission and commission." (February, 1952, *Methods Magazine.*)

"For every dollar you pay the printer for a form you generally have to spend about $20.00 for filling in, interpreting, mailing, filing, and storing it. The total cost of a form from cradle to grave is thus $21.00." (February, 1952, *Management Review,* "Forms Control Means Cost Control," by N. O. Convillon.)

I have made numerous studies of the cost of forms and clerical expenses in various insurance applications and have found the foregoing expenses are conservative. Generally speaking, it does not matter what you pay for your forms as long as you can save labor expense, however, to change your forms for change sake without saving labor expense, increasing production, improving efficiency or reducing forms cost, is probably an unwise move and one that will be expensive.

A forms control program will disclose the need for a form, and in so doing, faulty and unnecessary operations may be discovered that may be improved or discontinued.

An examination of a form and its use will reveal the minimum and maximum design specifications, which may bring about savings in forms cost, clerical work, and postage, with no resulting disadvantages.

A forms control program, also, will present a record of the uses of a form. It is surprising how the use of a form will vary from office to office. I recall an important monthly report that was prepared in four to eight copies. Our management decided that six copies were sufficient in even the most unusual cases. Quite obviously you can see that the four and eight copy offices were not equally efficient, especially if six copies of the report would do the job.

A forms control program will bring about purchasing economy. If you don't know what you need, how much you need, when you need it, and where you need it, how can you make economical purchases. Some of our studies have disclosed that we were purchasing or printing some

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forms weekly or monthly when we should have done so semi-annually or annually. Another very important item is the matter of combining or pooling orders. To do so will be likely to please your printer and reduce your costs. This is what I mean: Suppose you need several different envelopes of the same size for which your combined requirements are 100,000. If you place an order for each envelope as an individual purchase you are probably being charged the five, ten, twenty-five, or fifty-thousand rate, but if you pool your orders for a 100,000 order you will be charged at this rate plus an almost negligible plate change charge for each different envelope or form.

Forms control is necessary in simplifying procedures. Combining forms to do two or more jobs simultaneously is better than individual performance. To do so is a matter of economy and efficiency. A good form is more or less a picture of a good procedure, so if you don't know what is in the picture, what is on the form, how do you know that you have a good procedure? **s/p/a**

Worth Reading

"How to Write an Office Manual"—Larry Christenson, *American Business*, July 1955.

Recommends these nine principles of good manual writing and illustrates their use, with many examples:

(1) Use a simple "command" style
(2) Make it personal
(3) Use "natural" expressions
(4) Trim out excess words
(5) Use "active" verbs
(6) Use short simple sentences
(7) Watch out for interrupters
(8) Punctuation—*Talk* to your reader
(9) Paragraphs—Build them around a single idea

"Work Simplification By-Products Pay Off Big At Acme"—Harry M. Chapman, *American Business*, March 1955.

Describes the use of a common language punched type to expedite processing of information on customer orders at Acme Steel. By-products of the application are information on status of orders in production and awaiting production; advance work schedules, raw material requirements and labor loads; and automatic figuring of incentive wages for each job.

"Electronic Data Processing—Who, What, and Where?"—Herbert O. Brayer, *American Business*, March 1955.

The second article on the subject. General comments on appplications at various companies.

"Tightening Controls With Less Paperwork"—Robert D. Devereux, *American Business*, April 1955.

Describes how a knitting mill made 2 forms do the work of 8 previously needed to (1) acknowledge receipt of order (2) request label and hanger instructions from customer (3) give specifications to factory (4) provide basis for billing (5) act as shipping ticket (6) report production required.

"Taking the Gamble Out of Management Decisions"—Herbert O. Brayer, *American Business*, June 1955.

Discusses common types of reports required in various companies and their purposes. Indicates an approach useful in reducing the number of reports used.

"A Clinical Cost Control System Using Standard Time Data"—Edmond W. McNamara, *The Office*, June 1955.

Describes a simple way of determining staffing requirements for a payroll operation based upon standard times for processing clock cards and labor cards.

"Begin with a Big Electronic Computer"—Roddy F. Osborn, *The Office*, July 1955.

Detailed description of the planning done by a major company for leasing a Univac. Includes discussion of applications in various company activities with emphasis upon solving departmental problems.

"One-Day Order Processing"—*Management Methods*, June 1955.

Describes an order-billing system using pre-punched job cards for customer and item data. A punched tape, prepared automatically from the cards, is used to send the order by teletype to a warehouse.

"Application of Electronic Tape-Processing Equipment"—Fred Yeaple, *The Controller*, June 1955.

Detailed illustrated statement of processing a Blue Shield Claim operation on an RCA Bizmac system.

"How We Planned For Use of Electronic Equipment"—John S. White, *NACA Bulletin*, June 1955.

Generalized statement of considerations in one company's approach to the problem. Aspects dealt with include rough estimate of savings compared to rental charges, presentation to management, training employees who will use it, and familiarizing key company employees with the project.

"Experience of 300 Companies with Work Simplification"—Herbert O. Brayer, *American Business*, (Part I) May 55 (Part II) July 55.

Discusses the following questions based upon replies to questionnaire sent to 300 companies:

(1) What are the objectives of the program?
(2) How extensive are work simplification programs in business today?
(3) At what management level do the programs originate?
(4) What management levels are involved in the program?
(5) Who administers the program and how large is his staff?
(6) Is a specific training course given?
(7) Where do simplification ideas come from?
(8) What is the consultant's role?
(9) What are the cost aspects?

Includes a check list for reducing office and administrative expense.

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